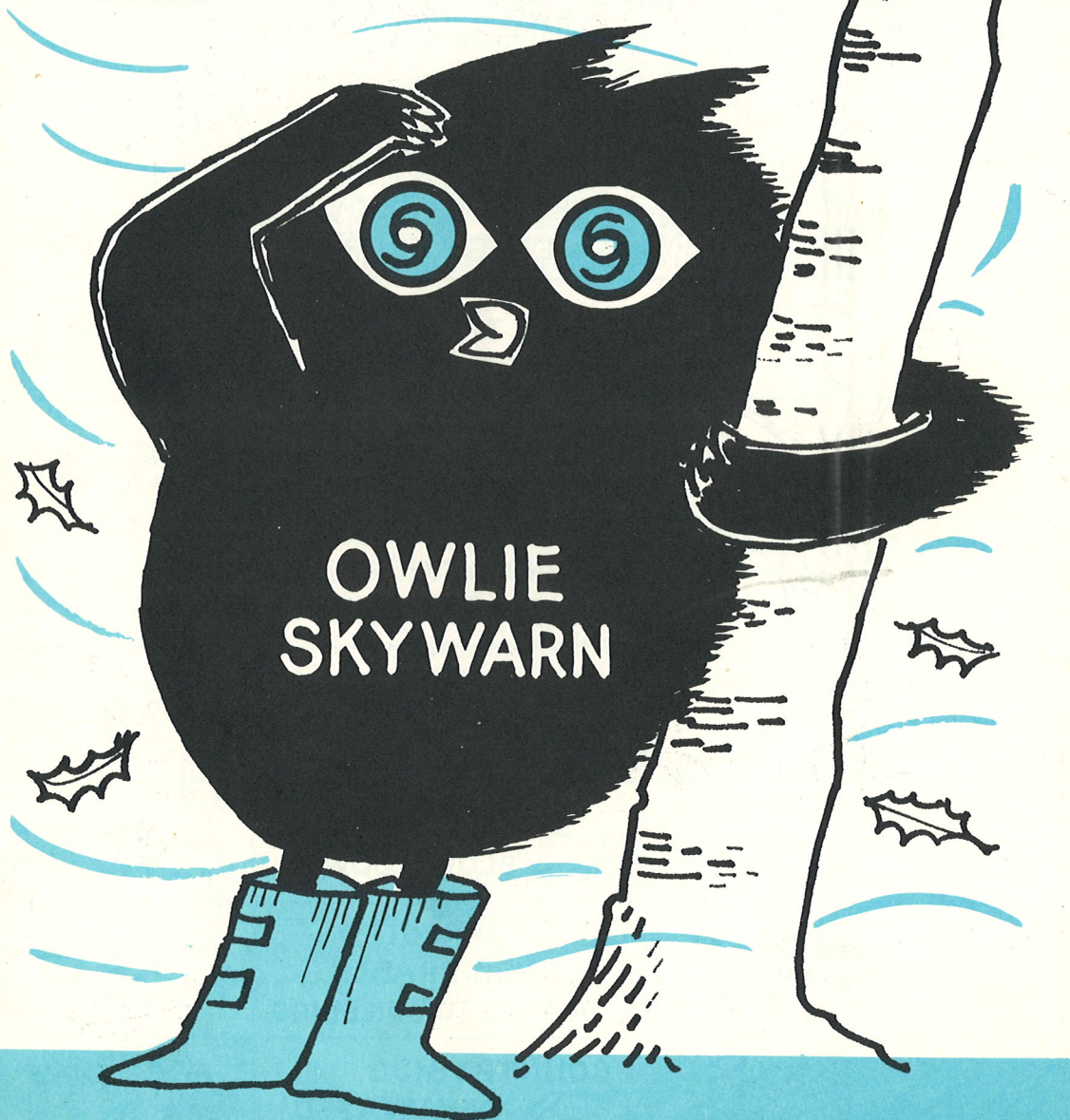




HURRICANE WARNING

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Weather Service



A BOOKLET FOR BOYS AND GIRLS
By Dr. Franklyn M. Branley and Leonard Kessler

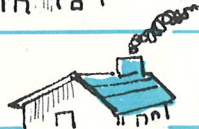


WIND SCALE

WIND SPEED
MILES PER HOUR

SMOKE RISES UP

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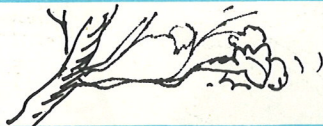
SMOKE DRIFTS

1-3



LEAVES RUSTLE
FLAGS STIR

4-7



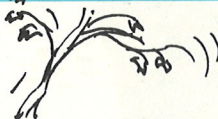
LEAVES AND
TWIGS MOVE

8-12



BRANCHES MOVE
FLAGS FLAP

13-18



SMALL TREES SWAY
FLAGS RIPPLE

19-24



LARGE BRANCHES
MOVE, FLAGS BEAT

25-31



WHOLE TREES MOVE
FLAGS EXTEND

32-38



TWIGS BREAK
WALKING IS DIFFICULT

TROPICAL STORMS { 39-46



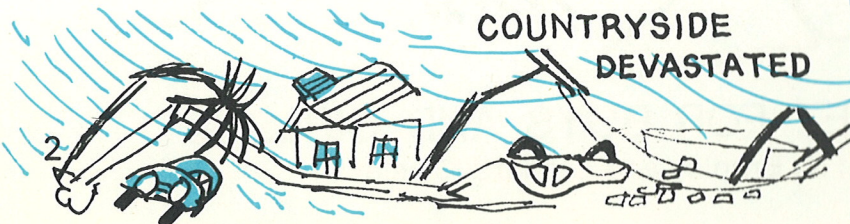
SIGNS, ANTENNAS
BLOWN DOWN

{ 47-54



TREES UPROOTED
CONSIDERABLE
DAMAGE TO BUILDINGS

{ 55-73



COUNTRYSIDE
DEVASTATED

HURRICANE
74 OR ABOVE



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| BRANCHES BEAT | 25-31 |
| REES MOVE EXTEND | 32-38 |
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| NTENNAS VN DOWN | |
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In the summer of 1969, hurricane Camille smashed into the coast of Mississippi. Hour after hour the wind whipped up the sea. Huge waves pounded inland. Rain poured out of the cloud-filled sky. The ocean had reached the ground floor of Sue Ellen's apartment building. The storm became more violent. In the black of night the water rose ten feet. Now it covered the floor of her second-floor apartment.

The wind whistled and roared—louder and louder. It blew out windows, scattering deadly slivers of glass. Higher and higher the water rose—to Sue Ellen's shins; to her knees. The whole building shook. It groaned and creaked. Cracks in the walls separated wider and wider. Pieces of the ceiling fell down—shattering on her table and splashing into the water that was now window high.



"We've got to get out of here," Sue Ellen's father shouted.

"We can't." Sue Ellen had to yell to be heard over the roar. "We'll drown out there."

"We've got to." Her father jammed a cushion into her arms and pushed her out into the night. The wind was screaming now.

Sue Ellen was carried away into the blackness. Moments later she heard the walls of the apartment collapse, and the roof fall in. She never saw her father again.

Barely keeping afloat, Sue Ellen was pounded by loose boards and trees, by doors and tables and chairs. It was so dark she could see nothing. Even if she were able to see, sheets of rain would blind her. The swirling flood pulled her under the water. She struggled up only to be



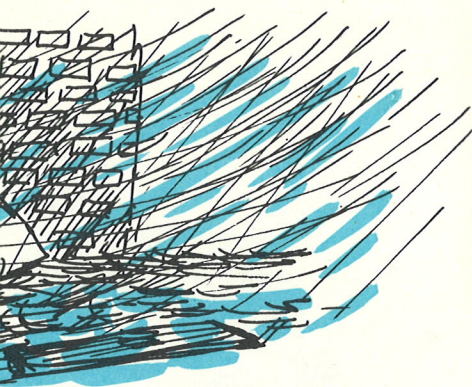
pulled under again. She was pulled under her whole body was under water. She was struggling for air, she was sick over and over.



After twelve hours, she was let down. Search parties found her miles away from the shore and barely alive.

She was one of the few friends who had decided to stay on land before the storm was safe. All but the others were drowned or flattened; there were no survivors.

Hurricanes are the most dangerous. They kill more people than any other kind of storm.



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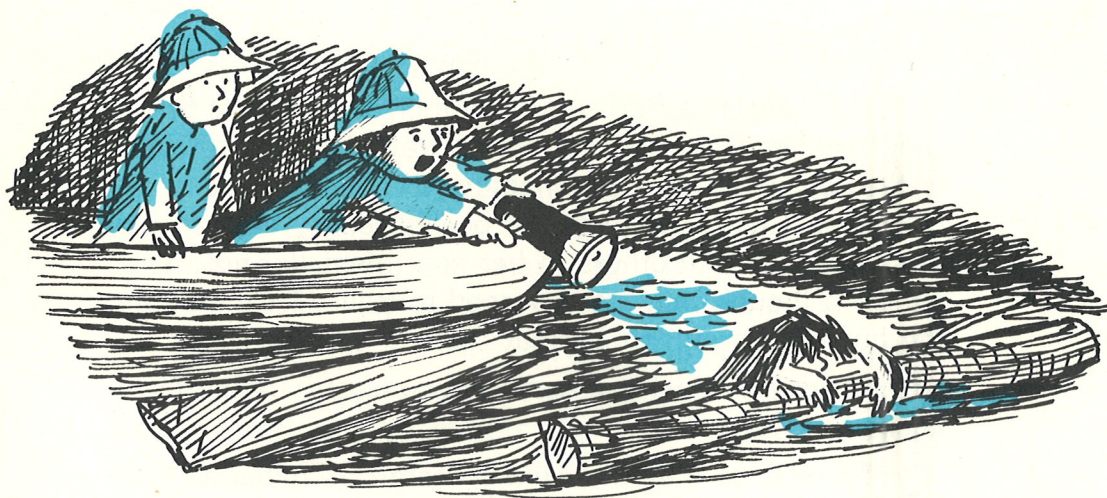
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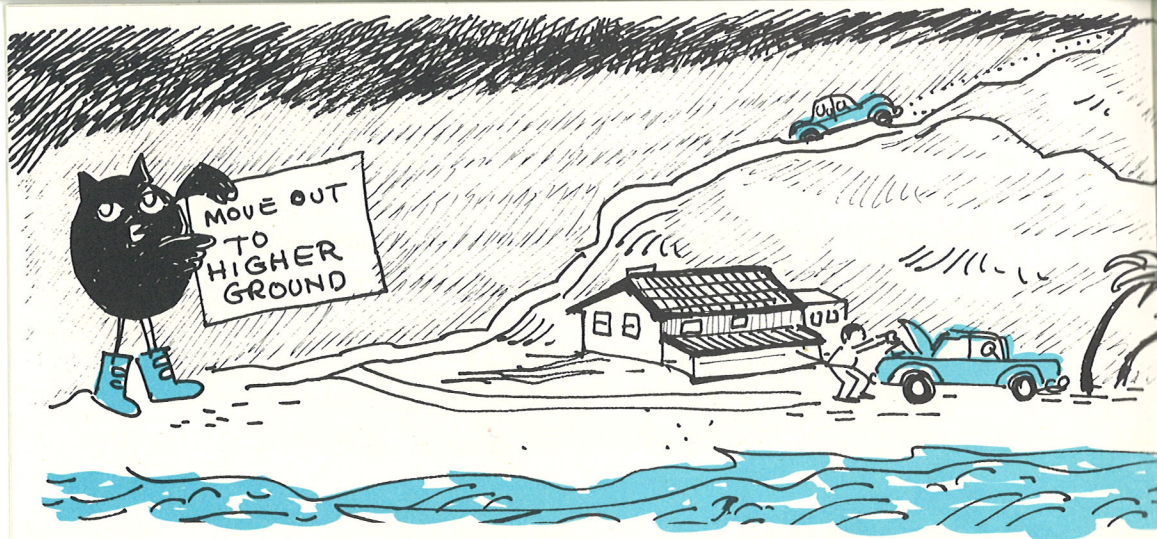
pulled under again. Her arms and legs, her back and face, her whole body was torn and bruised by nails and ragged edges. She was bloody and bruised. Hour after hour, gulping for air, she swallowed mouthfuls of salt water and was sick over and over again.



After twelve hours the fury of the hurricane finally let down. Searchers went out, looking for survivors. Four miles away they found Sue Ellen; cut, bruised, bleeding and barely alive.

She was one of the lucky people. Most of her father's friends had decided to stay at home instead of going inland before the storm hit. They all thought the building was safe. All but one of them were drowned. Many others were drowned too. Sue Ellen's apartment building was flattened; there was nothing left of it.

Hurricanes are the most dangerous of all storms. They kill more people and destroy more property than any other kind of storm.



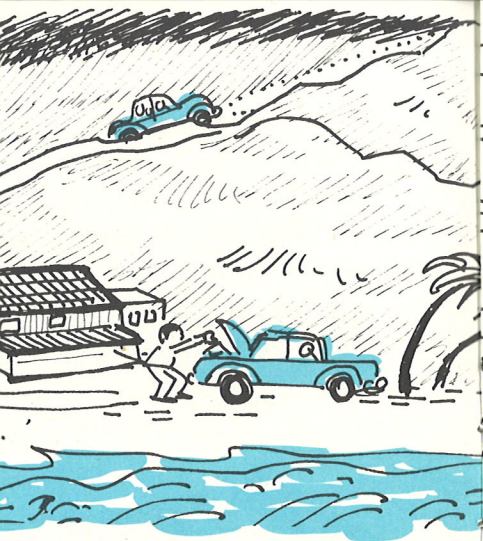
But people can be safe from them. Before the hurricane reaches land, people must move out if they're close to the sea. They must go to safe places inland away from the coast. Higher land will not be flooded by the surging sea. Sue Ellen and others in her apartment did not move out even though they were warned to leave. They thought the hurricane wouldn't be that bad.

Winds blow fast in a hurricane; at least 74 miles (119 kilometers) an hour.

Sometimes they blow much faster; as much as 200 miles (322 kilometers) an hour. The screaming, howling wind bends trees way over. They're pulled right out of the ground. Houses are blown apart. Mobile homes are pushed off their foundations or blown over by the wind. They are badly damaged. Sometimes they are shattered.

Hurricanes form over the sea. Many of those along the east coast of the United States come from the tropical





them. Before the hurricane, they should move out if they're close to the water. Places inland away from the water are flooded by the surging waves. The apartment did not move and he had to leave. They thought they were safe.

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Many of those along the coast come from the tropical

Atlantic Ocean. They also come from the Caribbean Sea and the Gulf of Mexico. The winds pile up the water along the shore. Sometimes the water is 24 feet (7.3 meters) higher than normal. On top of this dome of water there are big waves. When the water reaches land, people may be caught and drowned. The dome of water and the waves crash into buildings. Weathermen call this the storm surge. Houses are broken up. Boats are sunk, flipped over, or carried inland. Beaches are washed away. And still the water pounds.

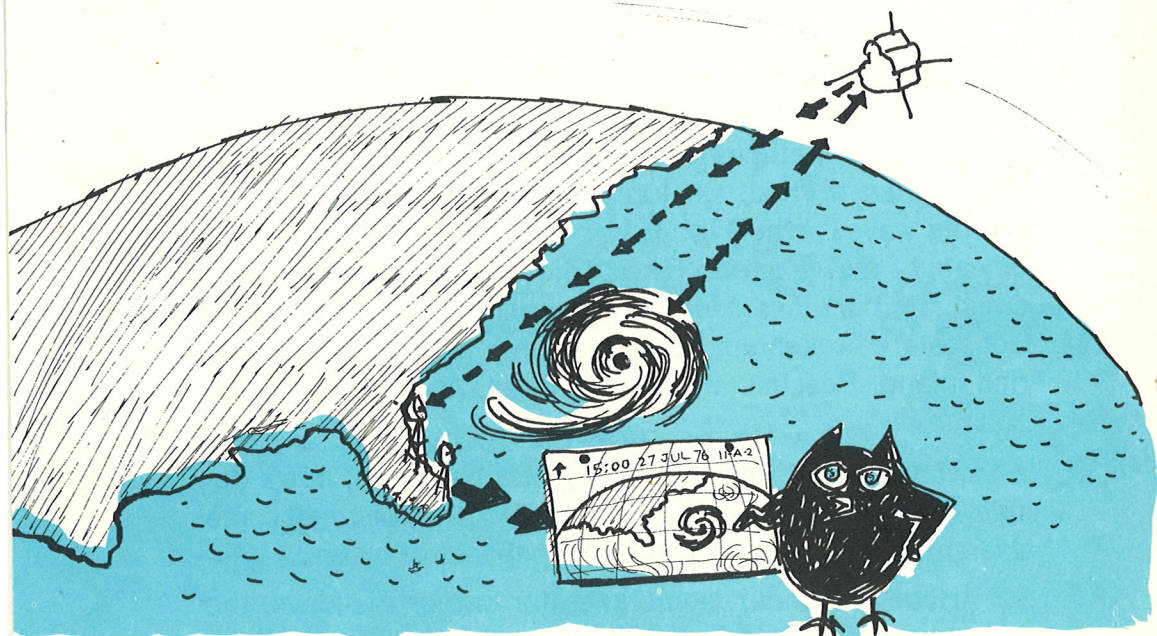
Hurricanes bring rain. Not just a hard rain; but a deluge—torrents of water. It rains so hard, the rain may come straight at you in almost unbroken sheets of water.

Hour after hour, sometimes for one or two days, the rain pours down. Sewers fill up and streams overflow. There is no place for the water to go. Floods spread across the countryside. Whole towns and villages are under water.

There is no electricity. Telephone lines are down. There is no drinking water. Fire engines and ambulances cannot move on the streets and roads. People may be stranded on the rooftops of their homes. The roofs themselves may be blown off. No wonder hurricanes are the most dangerous of all storms.

But hurricanes don't come as surprises. Fortunately we know about them before they arrive. Satellites about 22,000 miles (35,398 kilometers) above the earth take pictures of the Gulf of Mexico, the Caribbean Sea and the Atlantic Ocean. The pictures are sent to earth to NOAA (the National Oceanic and Atmospheric Administration—a part of the Department of Commerce of the United States).



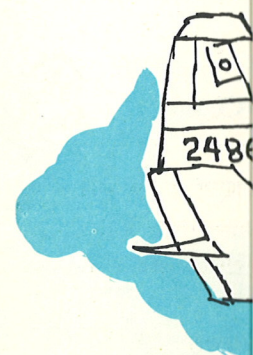


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Hurricane forecasters, at the National Weather Service's National Hurricane Center in Miami, look at the satellite pictures for a spiral of clouds forming a big uneven doughnut shaped formation. The small dark hole at the center is the eye of the hurricane. They continue looking at more pictures of the storm to keep track of it. Has it grown larger, or smaller; how far has it moved? The forecasters will name it when winds reach 39 miles (64 kilometers) an hour (tropical storm). They will call it a hurricane if the winds reach 74 miles (119 kilometers) an hour. Also they will give its location; its latitude and longitude.

If the storm should grow and move closer to land the hurricane forecasters call in the Hurricane Hunters. These are pilots who fly special hurricane planes right into the hurricane. Radar on the airplanes show the structure, location and rain pattern of the storm. Instruments on the planes measure temperature, humidity, windspeed, wind direction, and air pressure. Often the hurricane planes go right through the spiral clouds. High winds bounce the



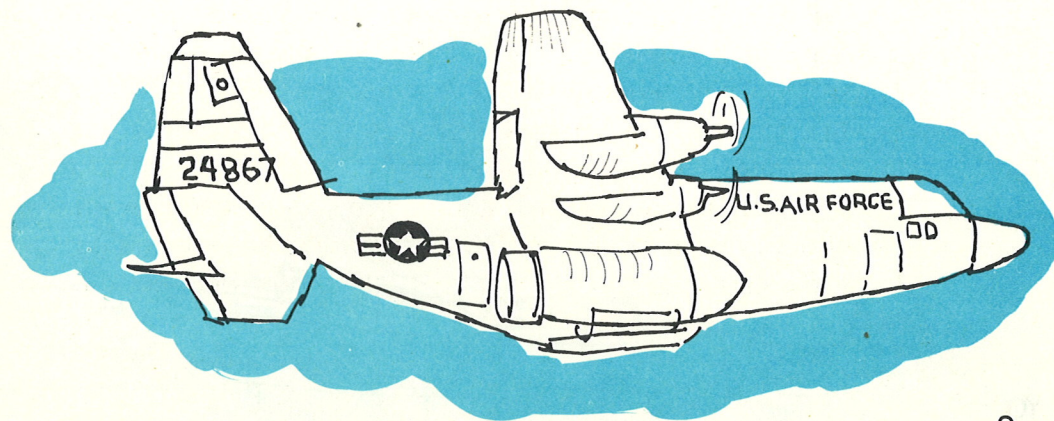


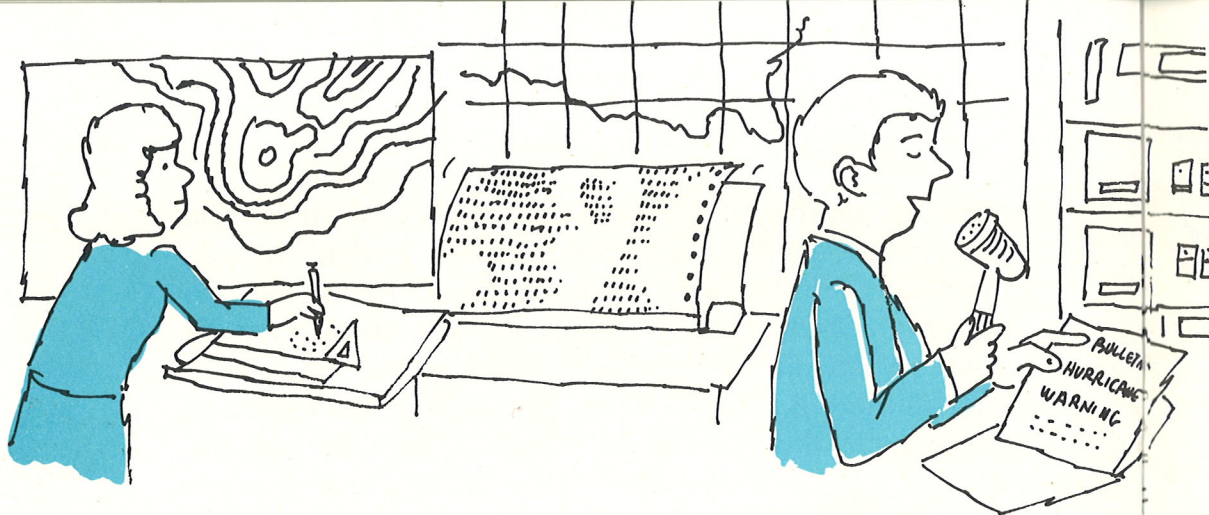
The National Weather Service in Miami, look at the satellite photos forming a big uneven hole at the center. They continue looking to keep track of it. Has it moved? The forecasters reach 39 miles (64 kilometers). They will call it a hurricane (119 kilometers) and its latitude and longitude.

and move closer to land the Hurricane Hunters. Hurricane planes right into the storm. Instruments on the planes show the structure, humidity, windspeed, wind direction. In the hurricane planes go High winds bounce the

plane up, down and sideways like a piece of straw. The pilots keep making measurements as they go right through the clouds into the eye of the hurricane. This is like the center of a doughnut—a doughnut hole surrounded by clouds. Suddenly the sky is almost clear, the sun is shining and there is little wind. But the men on the hurricane planes know this will not last. They go right through the eye and into the other side of the doughnut. The winds pick up quickly. This time they blow from the opposite direction. Once more the plane is banged about. But the planes keep going, right through the clouds and out of the storm.

Information gathered by the planes is sent to the Hurricane Center. Forecasters there know almost everything about the hurricane. They know how fast the winds are blowing, how big the storm is, its pattern of temperature and pressure. They use the information to forecast how the storm will move. It may move one direction today, and another direction tomorrow. It might move in a straight





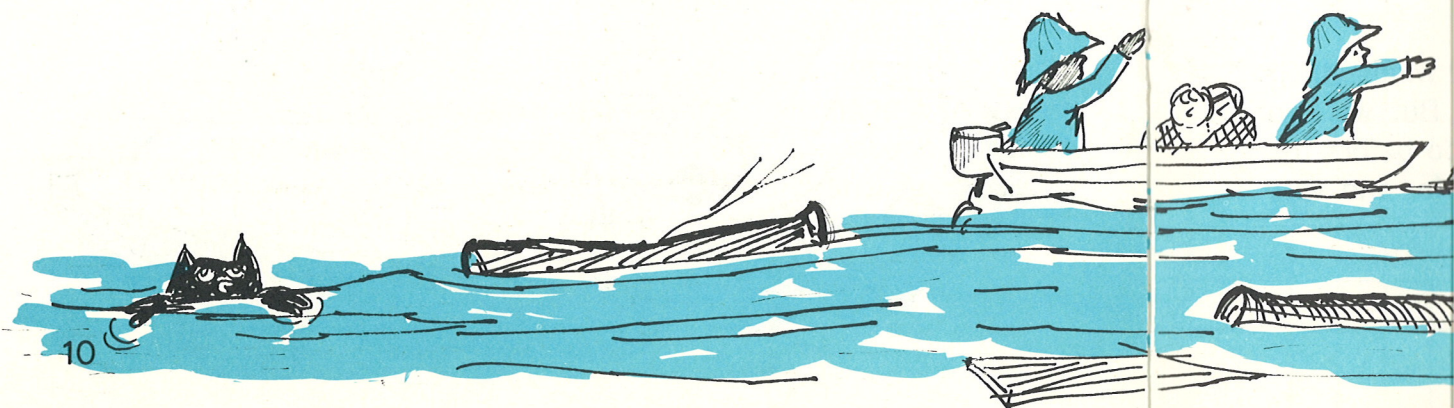
line, a curve, or even a loop. It might move directly toward the seacoast. When the weathermen decide the storm might reach land within two days they issue a Hurricane Watch. This tells people along the coast that the hurricane over the ocean might reach the land. The National Hurricane Center tells you what is happening. Keep listening to the radio or television.

As the storm moves closer to land, the winds become stronger. Dangerous high water and waves may be expected. The hurricane forecasters then send out a Hurricane Warning—a hurricane is expected to strike within 24 hours—get ready for it.

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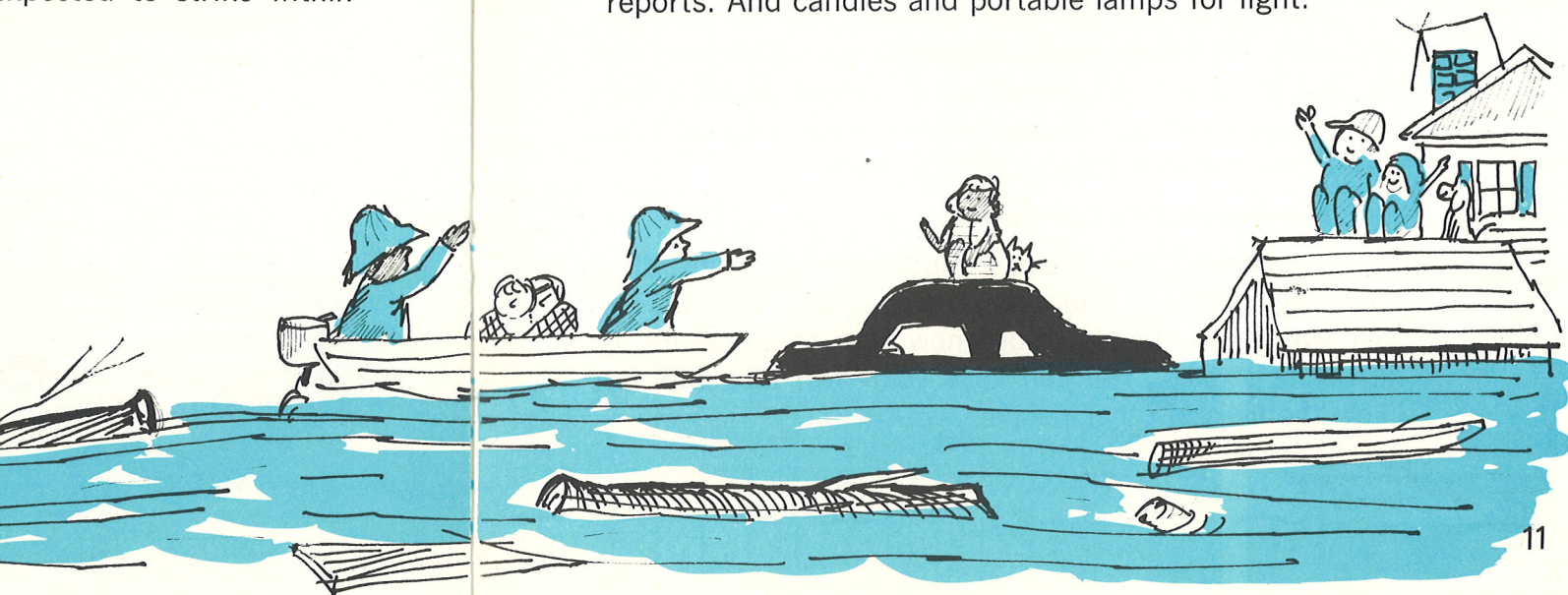
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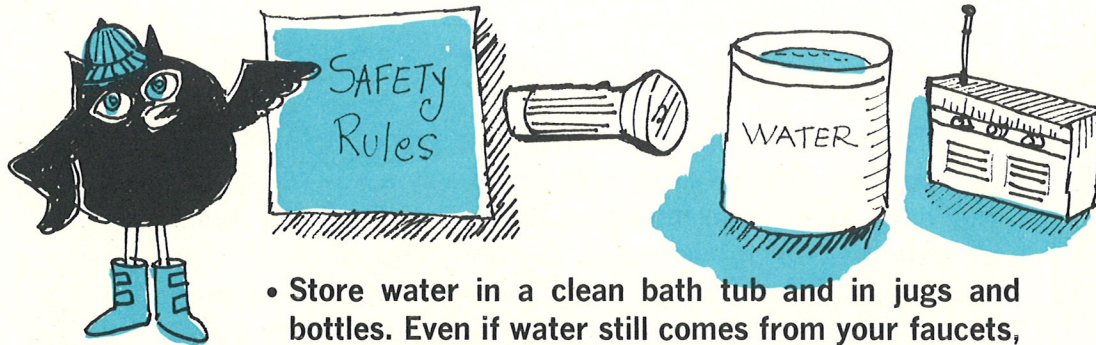
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Today more people live near the seacoast than ever before. Most of them have lived there only a few years and they have never been through a hurricane. They might not pay attention to the warnings. But they should. When the wind starts to blow down trees, when the sea roars over the beaches and when flooding spreads over the countryside, it is too late. Sue Ellen found that out. So did her father's friends and many others who were killed by hurricane Camille.

Everyone must plan ahead. Lives are saved when people know what to do. Tides will be very high. There will be a surge of water; deep water and big waves. If your house is close enough to the ocean that it might be flooded, leave it. But leave before the hurricane hits. Where will you go and how will you get there? The police and other local officials will know the best places. They are called storm shelters. There may be only a single road or a single bridge to your house. What would happen if the road or bridge became clogged with stalled cars, or if water covered it? Plan ahead. Get to a safe place inland before the hurricane reaches you.

If it seems safe to stay in your house, there are things you should do before the storm strikes. The electricity may go off. Have a battery-radio so you can hear the storm reports. And candles and portable lamps for light.



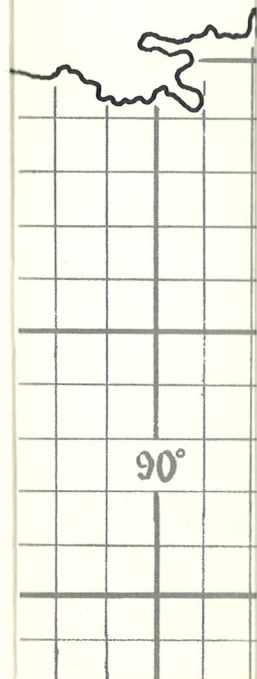


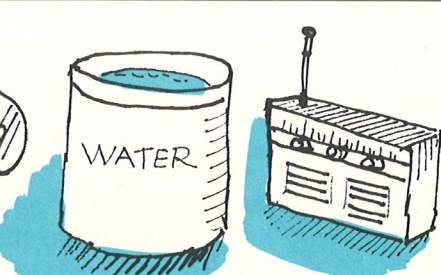
- Store water in a clean bath tub and in jugs and bottles. Even if water still comes from your faucets, it may not be good for drinking.
- Board up large windows. Smaller ones should be criss-crossed with tape. That's to keep pieces from flying if the windows are broken.
- Pick up every loose thing in your yard—toys, tools, boards, flower pots. They become as dangerous as bullets when picked up and shot along by the wind.
- During the hurricane, stay indoors. Don't go out to save something you forgot—a chair, table, or anything else. Let it go. The wind could knock you down. Falling trees could kill you, or you might be hit by a flying branch or stick of wood, or electrocuted by a broken power line.
- Beware the eye. The wind may stop suddenly, and the skies may clear. But the hurricane is not over. You are in the center of it. Soon the wind will be as furious as before. It will blow from the opposite direction, just as dangerously as before.

Hurricanes are big storms. They may stretch over 300 miles (483 kilometers). Someone has figured out that the energy in a hurricane is equal to that of 40 atomic bombs going off each second. There is no force we know about that is strong enough to stop them.

Hurricanes are killer storms.

We cannot stop them; their shattering winds, their pounding seas and their damaging floods. But we can save lives. Plan ahead so you know what to do before the hurricane strikes. You can save your own life, and very likely the lives of other people, too.





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Smaller ones should be
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...in your yard—toys, tools,
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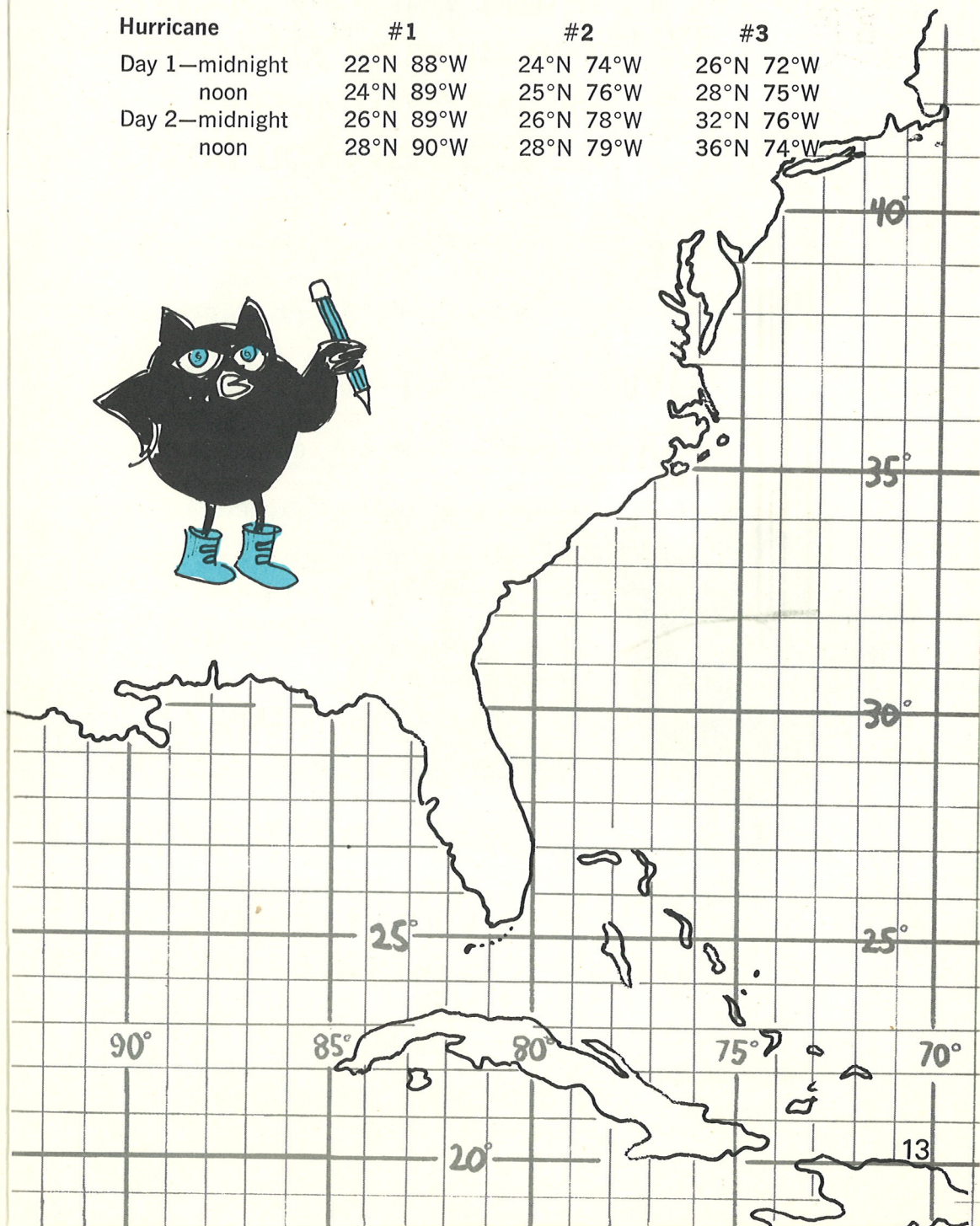
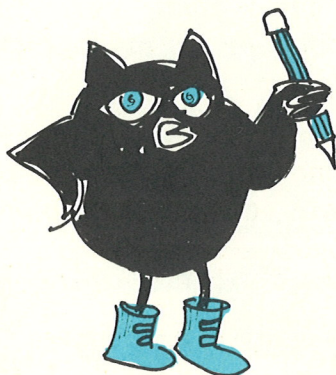
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TRACKING HURRICANES

The changing positions of three hurricanes are given below. Plot the positions on the map below. Connect the dots and you'll see part of the paths that they followed.

| Hurricane | #1 | #2 | #3 |
|----------------|-----------|-----------|-----------|
| Day 1—midnight | 22°N 88°W | 24°N 74°W | 26°N 72°W |
| noon | 24°N 89°W | 25°N 76°W | 28°N 75°W |
| Day 2—midnight | 26°N 89°W | 26°N 78°W | 32°N 76°W |
| noon | 28°N 90°W | 28°N 79°W | 36°N 74°W |



40°

35°

30°

25°

25°

90°

85°

80°

75°

70°

20°

13

IF YOU WANT TO CHANGE
THE MILES TO KILOMETERS
OR FEET TO METERS
HERE'S HOW YOU DO IT...

OWLIE SKYWARN METER READER



MILES TO KILOMETERS
MULTIPLY BY 1.609

300 MILES
X 1.609
482.7 KILOMETERS

FEET TO METERS
MULTIPLY BY 0.305

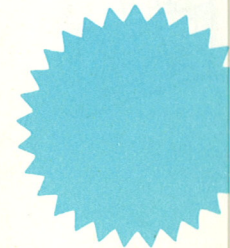
24 FEET
X 0.305
7.32 METERS

OWLIE



- ★ HAVE FLASHLIGHT
- ★ STAY INDOORS
- ★ GO TO A SAFE PLACE

I Certify
this is a member
of the Hurricane



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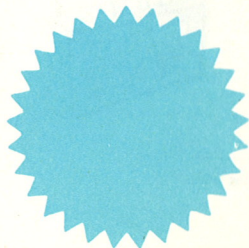
OWLIE'S HURRICANE SAFETY TEAM



- ★ HAVE FLASHLIGHT
- ★ STAY INDOORS
- ★ GO TO A SAFE PLACE

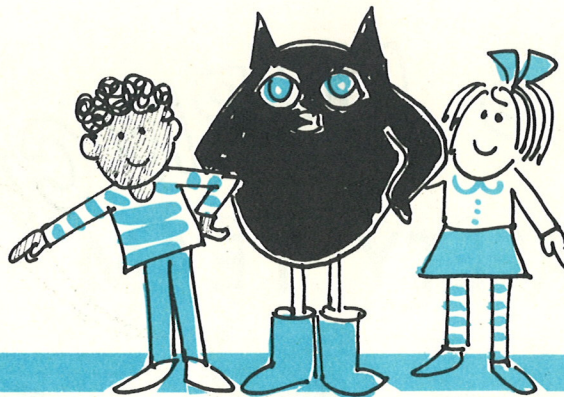
- ★ PLAN AHEAD
- ★ HAVE BATTERY RADIO
- ★ PICK UP THINGS
- ★ STORE WATER

I Certify that _____
is a member who knows and practices
the Hurricane Safety Rules.



Teacher/Parent

Date 15



OWLIE SAYS....REMEMBER

•STAY INDOORS •PLAN AHEAD

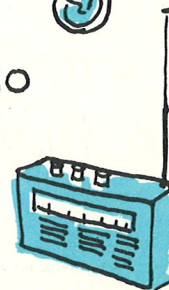
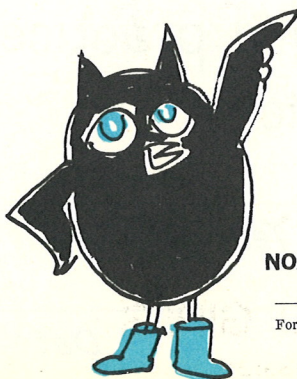
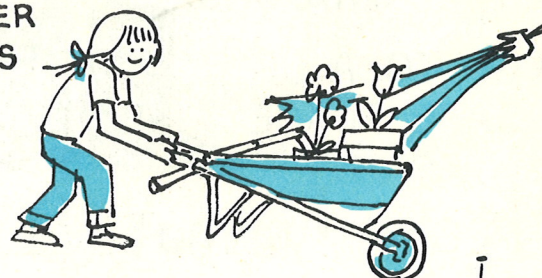
•GO TO A SAFE PLACE

•HAVE A FLASHLIGHT
AND CANDLES

•STORE WATER

•PICK UP
THINGS IN
YOUR YARD..
TOYS
FLOWER
POTS

•HAVE A BATTERY RADIO



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